Multi-level Perspective Within the Regulatory Framework of Shared Mobility: A Case Studies Analysis of Italian Demand Responsive Shared Transport Services (DRSTs)

Vincenza Torrisi[1(✉)], Roberta Campolo[2(✉)], Antonio Barbagallo[2], Pierfrancesco Leonardi[2], Matteo Ignaccolo[2], and Antonino Longo[2]

[1] Department of Electric, Electronic and Computer Engineering, University of Catania, Viale Andrea Doria, 6, 95125 Catania, Italy
vincenza.torrisi@unict.it

[2] Department of Civil Engineering and Architecture, University of Catania, Viale Andrea Doria, 6, 95125 Catania, Italy
campoloroberta95@gmail.com

Abstract. Shared mobility services belong to the group of Public Transport (PT) services, and they can be divided into two categories: scheduled and on-demand. Line services are characterized by scheduled timetables, fixed routes and stops. Instead, on-demand services are characterized by variable vehicle-routing and timetables considering changes in the mobility demand, in order to satisfy users' requests. In the last decades, innovative shared transport services, i.e., Demand Responsive Shared Transport services (DRSTs) have been implemented in addition to the traditional on-demand services, i.e., taxi and rental car with driver (NCC). The introduction of these new services is part of the legal framework linked to traditional PT, not adapted and detailed for DRSTs, making difficult to fully exploit all potentialities associated with these new transport services. The implementation should require a specific regulation able to define the operational features of the service and to avoid that DRSTs contrast or overlap with PT services. On that basis, this work proposes a Multi-Level Perspective methodology in order to provide a legal framework and analyze the criticalities linked to the introduction and implementation of DRSTs, mainly due to regulatory shortcomings. The paper focuses on the Italian legislation which is characterized by a gap for the implementation of DRSTs. At the regional level, these services have been partially defined and regulated, within the limits imposed by national legislation. Therefore, a comparative analysis is presented by analyzing several case studies (i.e., Piemonte, Valle d'Aosta, Friuli Venezia Giulia and Lombardia). The results of the research will constitute a practical tool to implement DRSTs in a permanent way and within the public transport supply.

Keywords: Demand Responsive Shared Transport services (DRSTs) · Legislation · Local Public Transport (LPT) · Multi-Level Perspective methodology · Sustainable Mobility

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1 Introduction

In the last decade and especially following the pandemic [1], Local public Transport (LPT) is suffering a reduction in the number of passengers [2], increasing the modal imbalance towards the use of private vehicles. This trend contrasts with the cities' environmental and urban planning policies for the promotion of sustainable mobility [3–5]. Indeed, the European Union (EU) has identified the Urban Sustainable Mobility Plans (SUMPs) as a tool for pursuing the improvement of transport mobility [6] of both passengers and goods traffic, in line with environmental, social and economic sustainability policies [7–10]. The main objectives of these tools include interventions to favor the modal integration of different transport modes and to improve the quality and quantity of the services provided. Moreover, considering the new mobility habits, it emerges that users need to have a different transport alternatives respect to the traditional LPT services. Therefore, to satisfy new users' requirements and attract more private transport users, new on-demand shared mobility services have been introduced [11]. These services complement the traditional taxis and NCCs and they are also grouped within the sharing mobility category. They can provide two types of sharing: (i) simultaneous sharing if both the vehicle and the journey are shared or (ii) an exclusive share if only the vehicle is shared. These on-demand services differ from traditional services due to their complete integration with digital platforms which is essential for the use of the service. The platform is useful to provide clear information to users about the service, giving a better perception of the associated quality and, at the same time, the operator can use this tool as a support to optimize the service and try to satisfy a greater number of users' requests. This interaction between transport supply and mobility demand is fundamental for these services in order to offer a greater accessibility and flexibility and attract users of private vehicles [12–15].

Sharing mobility services can be grouped into two categories [16]:

- Vehicle sharing the user shares the vehicle but not the journey, which takes place exclusively.
- Ride sharing: both the vehicle and the journey are shared, and the latter both partially and totally shared with other users.

The first category includes all the services characterized by a fleet of available vehicles (i.e. cars, scooters, bicycles, commercial vehicles). The user books the vehicle, uses it and then relocates it in the reserved areas, thus making the vehicle available to other users [17–20].

Instead, this work intends to deal with ridesharing services. There are different types of ride sharing services, from shared taxi to microtransit/DRST and the difference between these services for users is determined by the degree of flexibility [6, 21–23].

In U.S.A. these services have already been active for several years and there are specific regulations that define the type of service. The U.S. Department of Transportation defines microtransit as "*a privately owned and operated shared transportation system that can offer fixed routes and schedules, as well as flexible routes and on-demand scheduling. The vehicles generally include vans and buses*" [24]. In California they are defined as "*IT-enabled multipassenger transportation services serving passengers based on dynamic vehicle routing and with passengersmaking their way to and from common*

pick-up or drop-off points. Microtransit vehicles include (but are not limited), large sport utility vehicles, vans, and shuttle buses." [25].

The European regulatory framework has not explicitly defined these new forms of mobility, however, as the regulation of these services is in line with environmental and social policies, it is becoming a part of the government agenda.

The Italian national regulatory framework does not refer explicitly to demand services, above all to the new service types developed in recent years. Thus, this document aims to clarify the regulatory aspects for the implementation of a DRST service.

In Sect. 2 a legal framework is defined through a Multi-Level Perspective methodology, investigating the regulatory aspects related to the implementation of these innovative services.

Section 3 provides an analysis of Italian case studies and for each service it highlights the regulatory aspects based on which they have been implemented.

In Sect. 4 the results and conclusions are presented. The proposed analysis of legal tools in different contexts can be constitute a guide for administrations, to know and critically examine the key regulatory elements and to equip themselves with these tools.

2 Multi-level Perspective Methodology

The Multi-Level Perspective Methodology has the objective of investigating the possible answers and solutions to main questions related to the adoption and implementation of new on-demand transport services. The first step is the definition of the main issues related to the implementation of the DRST services by identifying four main questions; subsequently an analysis of the Italian legislation is carried out to identify whether and which services can be activated.

2.1 Identification of 4 Questions About On-demand Transport Services

The adopted methodological approach is characterized by the identification of four questions closely related to the implementation of the DRST services. The identification of these questions is linked operational service of these services in Italy, and in some cases as pilot projects. This analysis highlights the critical issues related to the activation of these services. With particular reference to the regulatory framework.

The first question investigates the need to have specific legislative tools for these services. It is necessary to clarify whether these services can be activated only on the basis of national legislation, or if a regional legislation is necessary (in Italy the responsibility for planning LPT services is delegated at the regional level) or even, they can be directly activated through an agreement between local authorities, service providers and operators.

The second question involves the operators. It is not often defined whether these services can be provided by operators, i.e. taxis or NCCs or by LPT companies which already operate urban and suburban services.

The third question concerns the territorial context and the type of service provided to users. On-demand transport services can be provided in areas characterized by weak-demand to replace traditional scheduled services, or in the suburbs areas not yet covered by LPT, to integrate scheduled services.

The fourth question relate to the possibility of obtaining an economic contribution for the service and the methodology for quantifying the provided service in kilometers or equivalent measures. This last aspect turns out to be very important because, unlike traditional scheduled services, demand services can stop due to the lack of mobility demand. During this time intervals, the vehicles are stationary, not generating kilometer production while continuing to offer the service availability to users. This availability implies fixed costs which must be quantified and gave to the transport company. For these reasons it is necessary to provide for a kilometric contribution different from that provided for traditional scheduled services (Fig. 1).

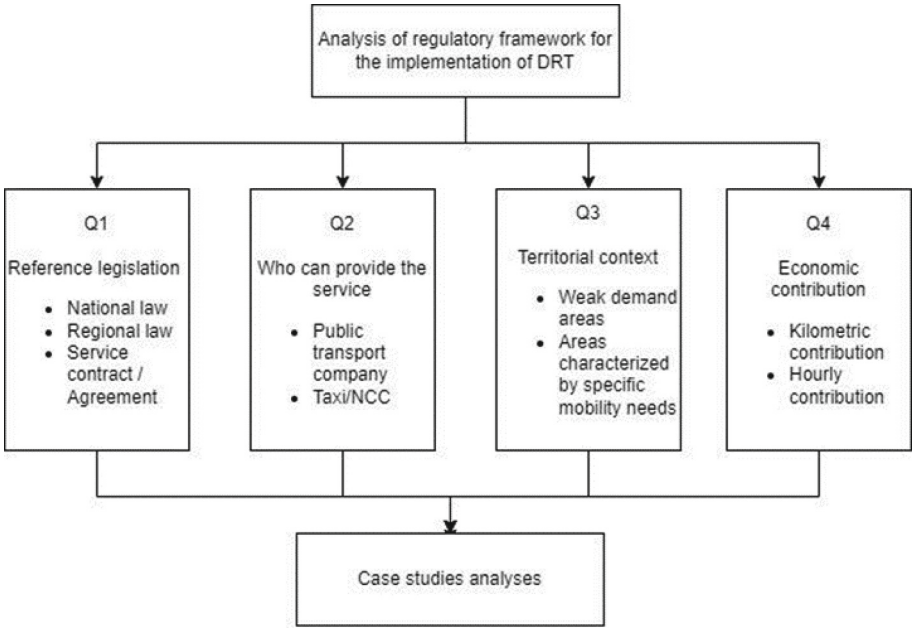


Fig. 1. Four questions within the Multi-Level Perspective Methodology

2.2 Legal Framework at the National Level

At the national level, LPT is regulated by the Legislative Decree 19.11.1997, n. 422 [26] and subsequent amendments. In Art. 6, paragraph 1, it delegates to the Regions the planning of regional and LPT services not included in art. 117 of the Constitution. Similarly, art. 7, paragraph 1, the Regions, confer to the Municipalities and other local entities all the regional functions and tasks in the field of LPT which do not require unitary exercise at the regional level. In particular, the Regions must define guidelines for the planning of LPT and specifically for Basin Plans, must draw up Regional transport plans and must approve the three-year service programs of TPL. The Legislative Decree defines regional and TPL services as transport services for people and goods, not in the national interest. They include road, rail, maritime and air transport systems, operating

continuously or periodically or with pre-established itineraries, timetables, frequencies and rates, at regional context. According to art. 14, it is possible to implement particular transport scheduled services in specific weak-demand areas, defined as areas in which the mobility demand is low because the users' trip requests are dispersed due to the territorial structure. Weak-demand areas are identified with the following criteria: a) population density; b) degree of urbanization; c) age of the resident population; d) altitude. The purpose of these services is to guarantee the satisfaction of mobility needs in these particular territories. These services must be assigned through competitive procedures to companies who have the requisites to operate non-scheduled public services or road passenger transport services. The scheduled public service differs from the non-scheduled one, which is regulated at national level by the Law 15.01.1992, n. 21 [27]. Non-scheduled public bus services are collective or individual passenger transport services, with a complementary and supplementary function to scheduled public transport. They are available on users' request, continuously or temporarily with flexible routes and timetables (paragraph 1). They consist of taxi and NCC services (paragraph 2). The taxi service is addressed to a generic user; the vehicles are stationed in a public area and must be distinguishable from other vehicles; the tariffs and the characteristics of the service are determined by the competent authorities; the pick-up points are located within the municipal area (art. 2, paragraph 1); the service provision is mandatory (paragraph 2). According to art. 3, the NCC service is addressed to a specific user, who makes a trip request at the depot for a specific timed also through the use of technological tools (art. 3, paragraph 1). Vehicles cannot wait for requests on public spaces, but only inside the depot (paragraph 2). The operational headquarters and at least one depot must be located in the municipality that provided the authorisation. It is possible to have a depot within other municipalities of the same metropolitan area, with prior communication to those municipalities (paragraph 3). With the Decree Law 07.04.2006, n. 223 [28], the legislator has strengthened the competition for the taxi service, in particular with regard to market access, pricing, increased efficiency of service and quality. After, with the art. 37 of the Decree Law n. 06.12.2011, n. 201 [29], the legislator assigned the Transport Regulatory Authority (ART) specific tasks to improve the taxi service.

In particular:

- increase the number of licenses, if necessary, following comparisons and investigations about costs-benefits analysis, including environmental aspects, in relation to mobility needs and demographic characteristics;
- organize the service with greater flexibility during particular exceptional events or periods with increasing mobility demand, proportionated to user needs. Develop new supplementary services such as taxis for collective use or other forms;
- have greater freedom in tariffs' determination;
- improve the quality of the provided service.

With the "Notification Act to the Government and Parliament about non-scheduled road transport of passengers: taxis, NCCs and technological services for mobility" of 21.05.2015 [30], the Authority highlighted the opportunity to review the rules governing the taxi service. Giving license holders more freedom in organizing the service, for particular extraordinary events or periods of increased demand with flexible timetables and develop new supplementary services such as the collective use of taxis. With a note

of 16.07.2020, addressed to the National Association of Italian Municipalities (ANCI, from Italian: "Associazione Nazionale Comuni Italiani) and the Conference of Regions and Autonomous Provinces, the Authority intervened on the use of web connectivity systems and new technologies to facilitate the interaction between the supply and the demand of taxis. On the basis of the decisions of the Council of State, in the sentences of 04.06.2020, n. 3501, n. 3502/2020 and n. 3503/2020, the ART set out these needs:

- remove regional laws and/or municipal regulations that can limit the autonomy of taxis to use the interconnection services between supply and demand;
- promote the development and diffusion of innovative and competitive systems for the interconnection between users and operators of the taxi service, to increase the efficiency and quality of the provided service;
- ensure that the market for intermediation services between supply and demand is open and competitive.

The European Union published the Commission Communication on efficient and sustainable on-demand local transport of passengers (i.e. taxis and NCCs) 2022/C 62/01, which supports the efficiency of services, the access to efficient and sustainability mobility, the environmental sustainability and the use of advantages offered by digitalization. Finally, the Authority on 23.03.2022, with the Resolution n. 46/2022 [31], adopted the Guidelines on adaptation of the taxi service for Regions and Local Authorities regarding the use of web connectivity systems and new technologies to facilitate the interaction between the demand and the supply of taxis. The objective is to provide, also through methodological indications, a decision-support tool for the competent authorities to optimize the service, also considering the technological platforms for the interaction between the supply and the demand, monitor the quality of this tool also through the preparation of customer satisfaction surveys. The use of technological platforms is one of the main problems in terms of sharing mobility. Sharing mobility identifies a set of mobility services, alternatives to one's own vehicle or collective vehicles. These are used temporarily thanks to the use of digital platforms that guarantee the sharing of vehicles and journeys. These platforms also allow to book and pay for the service through IT devices. From a legal point of view, one of the most important issues is the correct qualification of the activities performed by the IT platforms. If they constitute a simple intermediaries between supply and demand or if they are direct suppliers of the transport service. The classification is important because if they are considered direct suppliers of innovative transport services, they must comply with all the legal provisions regarding for example safety, access to the market and responsibility towards users.

3 Case Studies Analysis

In this section four different case studies have been selected, i.e. Regions of Piemonte, Valle d'Aosta, Lombardia and Friuli Venezia Giulia, which have implemented flexible forms of on -demand transport service with different characteristics and within a regional regulatory framework different from each other.

- Case study 1: Piemonte (Torino/Asti) Region

The first case study concerns the regulatory analysis of the flexible mobility systems implemented in the Piemonte Region. In particular, the Regional Law 04.01.2000, n. 1 has been analyzed, which regulates the LPT in the Region, in actuation of the Legislative Decree 19.11.1997, n. 422. Then two Service Contracts have been analyzed, relating to the transport systems in the metropolitan area of Turin and in the Basin of Asti [32].

The Regional Law 04.01.2000, n. 1, art. 2, defines the regional LPT system as the functional integration of regional, provincial and urban scheduled services and supplementary or substitute for scheduled services. These services are carried out in different ways, and they are extended to areas characterized by low population density, with low demand, or able to satisfy complementary mobility or special needs. These services are organized and managed by the mountain communities, or by the interested municipalities together associated, in areas with low demand. Indeed, according to art. 6 of the same Law, within weak-demand areas, local authorities can identify particular procedures for carrying out scheduled services. These services can be self-managed or assigned, through competitive procedure to subjects who have the requisites to operate non-scheduled public bus services or road passenger transport services. If there is no supply of these services, vehicles used for one's own use can be used. In any case, it is required the possession of the professional requisites for the exercise of public transport. In the Service Contract for the management of local suburban road public transport services of passengers by road by bus in the metropolitan area of Turin - valid from 08.01.2012 to 07.31.2018, then followed by provisions for the extension and imposition of Public Service Obligations [33] – it has been envisaged to review the services in relation to the demand trend and revenues. This is possible by (wholly or partially) replacing bus lines with other services, integrating/extending the existing on-demand services and/or setting up new ones. Specifically, the contract has identified these on-demand services as services with flexible or fixed routes and timetables and the service carried out only by reservation. For this type of service, the contract provides for the possibility of using small vehicles (M1 or M2) or vehicles not used for scheduled services (i.e. taxi or NCCs) according to the terms and conditions described in the documents integrating the contract.

The economic compensation for on-demand services have been defined on the basis of an average unit value of €1,407/vehic*km, while the travelled distances (km) have been calculated on the basis of a "distance matrix", pre-defined in agreement with the concessionaire, considering the sum of the travelled route along the entire path of each journey. In addition to the variable compensation, a flat fee has been considered for call center charges of € 18.00/h (with reference to each call-center and each opening day). The compensations would have referred only to the actually made runs, i.e. "commercial runs" with passengers on board. Instead, in the Service Contract for the regulation of the

assignment of LPT extra-urban services for the period 2010–2015 in the Basin of Asti, it has been envisaged that a part of the compensation is intended for the implementation of flexible services, on the basis of a unit compensation per kilometer set at €1.11/km within the contract. Specifically, it has been expected that the annual compensation, regardless of the number of travelled kilometers, is to be calculated as the product of the kilometric compensation for flexible services and the kilometers performed by scheduled services changed into flexible services, respecting the limit of kilometers foreseen for flexible services. In the case ok travelled kilometers less than 50% of (changed) kilometers associated to the traditional scheduled service, the compensation would be reduced by 20%. Specifically, it has been agreed in the contract that 891,192.60 km/year for ordinary services could be replaced with alternative services mileage of 712,954.08 km/year.

- Case study 2: Valle D'Aosta Region

The second case study concerns the regulatory analysis of the flexible mobility systems implemented in the Valle D'Aosta Region. In particular, it has been analyzed the Regional Law 09.01.1997, n. 29, "Rules on scheduled public transport services", which regulates LPT in the Region. The Regional Law Valle D'Aosta 09.01.1997, n. 29, in the art. 53, [34] provides that the Region can define, coordinate and authorize transport services supplementary to public transport. Specifically, "supplementary services" are divided into scheduled, non-scheduled and on-demand supplementary services. These last are defined as performed services with fixed or flexible routes upon reservation by users. According to the Law, the purpose of these services is to satisfy specific mobility needs, including tourism, not adequately ensured by scheduled public transport, and meet the mobility needs in weak-demand areas during the day (e.g. afternoon or evening) to supplement scheduled services.

To carry out these services, the Regional Council is authorized to provide specific agreements with the concessionary companies of the scheduled services within the related sub-basins and with NCCs or taxis. The Law defines the cost of the service based on a kilometric or hourly compensation: in the first case it cannot exceed the compensation set out in the sub-basin service contract, which can be increased up to a maximum of 10%; in the second case, the cost is calculated on the basis of the service type offered and the criteria already defined in the contract.

The hourly unit cost is defined by the Regional Council on the basis of the fixed unit compensation following the award to the concessionaire. It is also envisaged that local authorities can set up additional on-demand services to integrate the regional public transport service, if missing or inadequate. This is expected in order to meet mobility needs for students, tourists or for particular periods of the day, i.e. at night in areas with low demand. The Regional Council establishes the criteria for carrying out the services and defines the possible contribution by the Region. The tariffs for these services are determined on the basis of the scheduled service ones, which can be increased in relation to the service characteristics (e.g. frequency) [35].

- Case study 3: Lombardia Region

The third case study concerns the regulatory analysis of the flexible mobility systems implemented in the Lombardia Region. In particular, three legal tools have been analyzed: the Regional Law 04.04.2012, n. 6, which regulates the transport sector in

the Region, the Guidelines for the drafting of LPT catchment programs N° X/2486 of 10.10.2014 [36] and the Coordination Guidelines for the assignment of the LPT service and drafting of service contracts approved with D.G.R. no. X/4927 of 14.03. 2016 [37].

The Regional Law 04.04.2012, n. 6, classifies in art. 2, paragraph 2 letter a), regional and LPT services as scheduled services, if they are organized on a continuous or periodic basis with pre-established itineraries, timetables, frequencies, tariffs and conditions, also through innovative services organized with particular modalities, e.g. on-demand services.

The guidelines for the drafting of LPT basin programs N° X/2486 of 10.10.2014 propose two operating models for the creation of on-demand services:

– with fixed routes and journeys made only upon reservation (suitable for extra urban area with low demand);
– with flexible routes and journeys made only by reservation, according to the two commonly used models:

  i. the "many to one" model, with a service that picks-up users at stops within the area and picks-off them to the destination, typically represented by a Point of Interest (POI) or general service, e.g. hospital, shopping center or station;
  ii. the "many to many" model, in which the service does not have route and time constraints, but it is determined only on the basis of user requests, who can book a ride between any two stops in the service network. This model provides for greater operational flexibility, but also greater management complexity, offering a more widespread service and higher user satisfaction rates.

In particular, for on-demand services, the coordination guidelines for the assignment of the LPT service and the drafting of service contracts approved with D.G.R. no. X/4927 of 14.03. 2016, define, in Annex A, how to carry out this conversion of the provided "on-demand" services into equivalent distances.

The document defines two types of trips:

- Equivalent travelled distances for contractual purposes (Peq) are the equivalent distances to which the unit price will be applied;
- Programmed travelled distances (Pprog) are the distances that the service manager actually makes available for the implementation of on-demand services to replace scheduled services.

In the case of services with flexible timetables and (i) a predefined basic route with the possibility of detours; (ii) with flexible routebetween a predefined set of pick-up and drop-off points; (iii) with flexible route with the possibility to explore all the nodes of the network, the equivalent distances are determined considering the working hours of the "driver with vehicle" available during the daily service and the commercial average speed, with the application of a correction factor. This factor concerns the probability of effective service provision and the higher management costs for the flexible service

compared to those for the scheduled ones, according to the specific formula defined in the contracts.

- Case study 4: Friuli-Venezia Giulia Region

The fourth case study concernes the regulatory analysis of the flexible mobility systems implemented in the Friuli-Venezia Giulia Region. In particular, it has been analyzed the Regional Law n. 23,20.08.2007, which regulates LPT in the Region and the organization of flexible transport services set out in the General Plan of LPT [38].

The Regional Law n. 23,20.08.2007 (Implementation of Legislative Decree 111/2004 on regional and LPT, freight transport, motorization, road traffic and viability), [39] defines in art. 5 paragraph 1, letter a), the regional and LPT system as the set of transport services of regional interest, including the railway, tramway, automobile and maritime services carried out on a pre-established route or in a flexible way, organized for integrating various transport mobility systems, used for the collective transport of passengers and goods. The art. 5, paragraph 1, lett. h) also defines scheduled bus services, considering them as services with an itinerary between two terminal stops within the first and second level of the transport network; instead, at letter i) flexible car services are differently defined as on-demand services performed in weak-demand areas and low-demand times, with fixed or flexible routes and with the use of technologies, within the third level of the transport network.

The low demand areas are defined by the Regional Plan of Local Public Transport (PRTPL, from Italian "Piano Regionale del Trasporto Pubblico Locale"). The Regional Law (art. 8) also states that the public transport system consists of a) a first-level railway and road network; b) a second-level railway and road distribution network considering arterials (for traffic distribution) and collectors (for traffic penetration); c) a third level network based on flexible services.

Indeed, the Report of the General Plan of LPT defines the structure and organization of public transport. In particular, according to decreasing hierarchical level, transport services become more pervasive across to the local territory and through the third-level network they satisfy mobility needs at local scale, covering routes within restricted territorial areas and with innovative service types, according to flexible mobility needs, time and space-varying. Specifically, during the assignment phase, it is envisaged a concrete definition of flexible services to replace scheduled ones. Then, during the operational phase, according to the results of the monitoring, there is an eventual redefinition of the services, also through the planning of flexible services.

The Report identifies various types of flexible services. (i) The first service type is defined "of improvement" which refers to Municipalities with weak demand, for irregular users and established through the replacement of runs of existing extra-urban line, exercised during pick-off hours. The aim of this type of service is to improve the quality of the service, through the provision of flexible services, because within areas with a high dispersion of settlements the demand for non-systematic mobility is distributed along several directions. These services must be exercised according to the Explanatory Report and the contractualized mileage production, since they derive from the conversion of existing 2nd level services. (ii) The second service type is defined "of extension". It is envisaged for all Municipalities with weak demand, and it has the

specific purpose of expanding the LPT network within areas not yet served and improving existing connections.

In addition to these two types of services, there are a third and a fourth type, referring to Municipalities characterized by partial situations of weak demand. (iii) Specifically, the third type refers to services that can be implemented in urban areas during time slots or situations characterized by low demand, e.g. during the night or for public holidays, even replacing existing services. In sub-urban areas these services can be established with the integration of existing extra-urban services with flexible services; in this way it is possible to improve the connection between the provincial capitals and the surrounding municipalities; in the case of Trieste it includes all the municipalities of the city.

(iv) The fourth type of services refers to particular road directories for the connection between the hamlets and the municipal capital, and for particular road directories for which there is the opportunity to transform a part of scheduled services into flexible services or new ones. This consideration derives from the monitoring activities and this services' transformation is possible when the polarities of origin and destination of the connection, even if not overall resulting in weak demand, they are attributable to weak-demand areas for the particular category of users along the connection.

Lastly, the Report specifies that flexible services, as well as replacing existing scheduled services, can be implemented by upgrading them through:

- the use, even partial, of the increases in kilometer production envisaged by the Plan;
- the use of additional available kilometric productions;
- available resources by local authorities for the activation of flexible supplementary services according to the art. 12, paragraph 1, letter d) of the Regional Law 20.08.2007, n.23 (which letter provides that the Municipalities exercise the function of "proposing and establishing flexible supplementary services without charges for the regional budget, in coordination with the territorially competent Province").

4 Discussions and Conclusions

From the analysis of the four case studies, it emerged how the DRT services have been planned and implemented in a partially different way from each other. In all four cases, the Regional Law represents the legal basis for the establishment of the service, because it includes flexible/on-demand services among the LPT services. The Valle d'Aosta Regional Law qualifies this category of services in a clearer and more specific way than the other three Regional Laws. It concretely defines the rules for implementing them. In the case of Piemonte Region, instead, some operational choices have been better identified directly in the Service Contracts (Figs. 2 and 3).

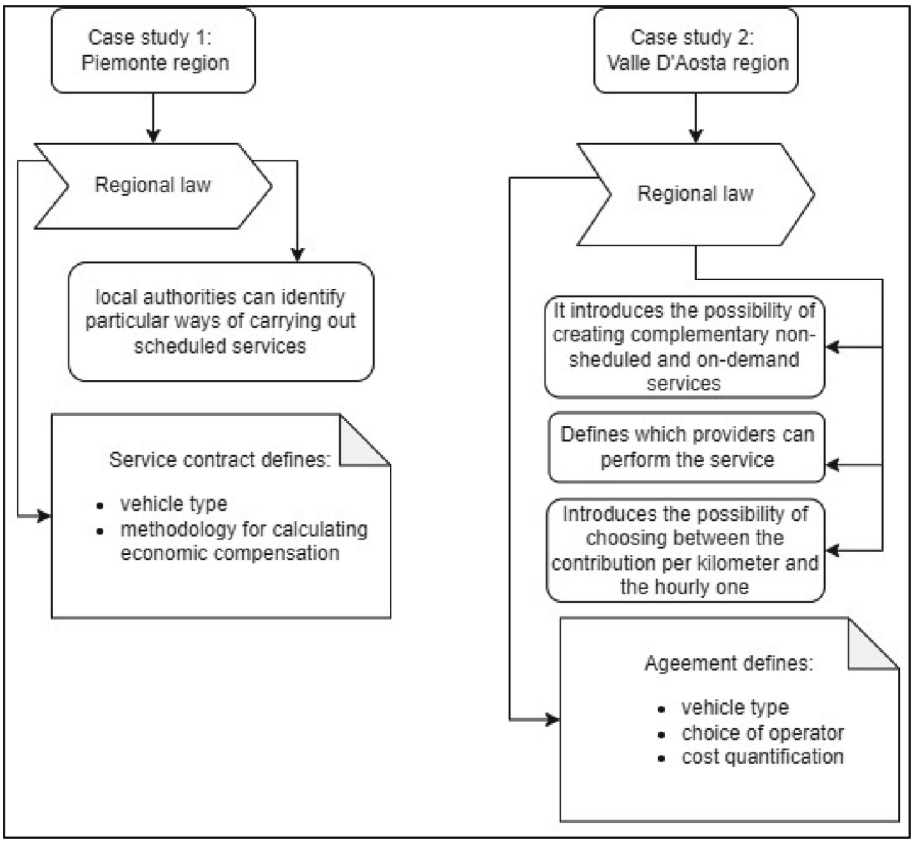


Fig. 2. Framework case study 1–2

The Guidelines drawn up by the Lombardia Region represent a very useful tool to define in advance the operating models for implementing on-demand services. They define how to convert the supply of on-demand services in equivalent travelled kilometers.

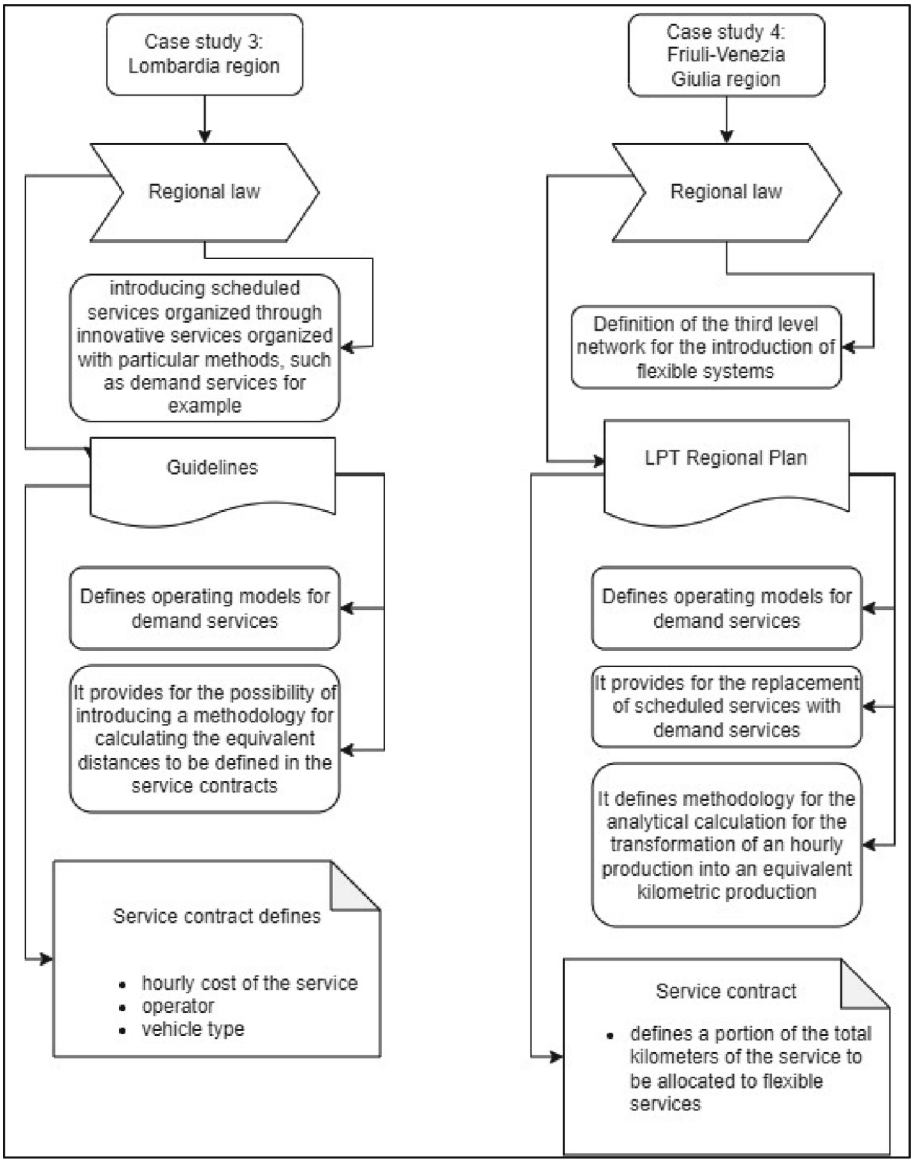


Fig. 3. Framework case study 3–4

From the performed analysis it emerges that flexible services represent a useful tool to better satisfy the mobility demand, where traditional transport are insufficient. However, these flexible services are considered a component within the regulatory framework of the traditional LPT. Consequently, to organize these services it is necessary to respect the existing legislation and its constraints. This makes it more difficult to program totally flexible forms of transport services that fully satisfy the specific users mobility needs. The

future development of the research will focus on an in-depth analysis of the other regional laws and the reference regulatory framework in order to introduce new on-demand services characterized by high flexibility.

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